

May 12, 1931.

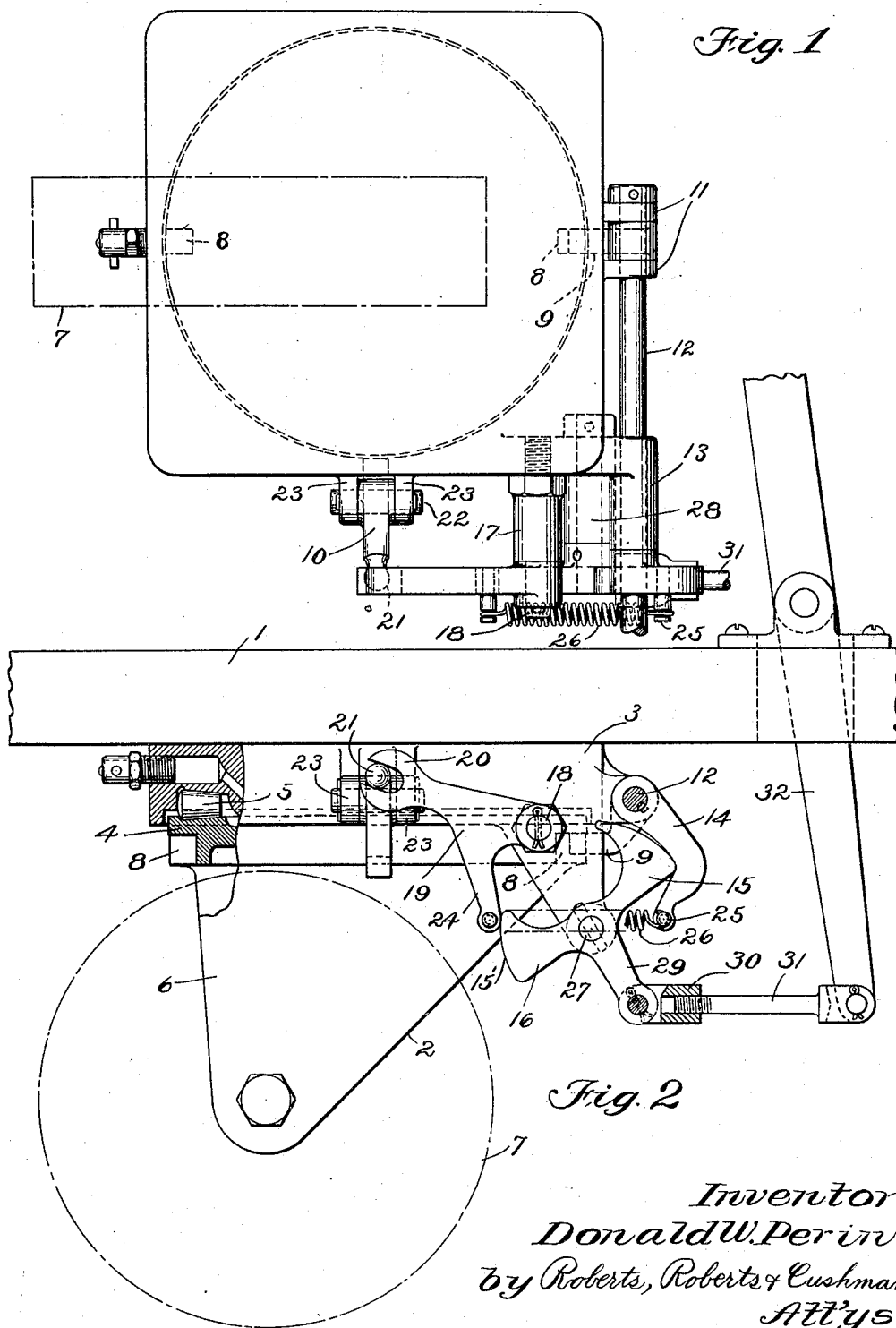
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1,804,541

CONTAINER HAVING SWIVEL CASTERS

Filed Oct. 6, 1925

4 Sheets-Sheet 1



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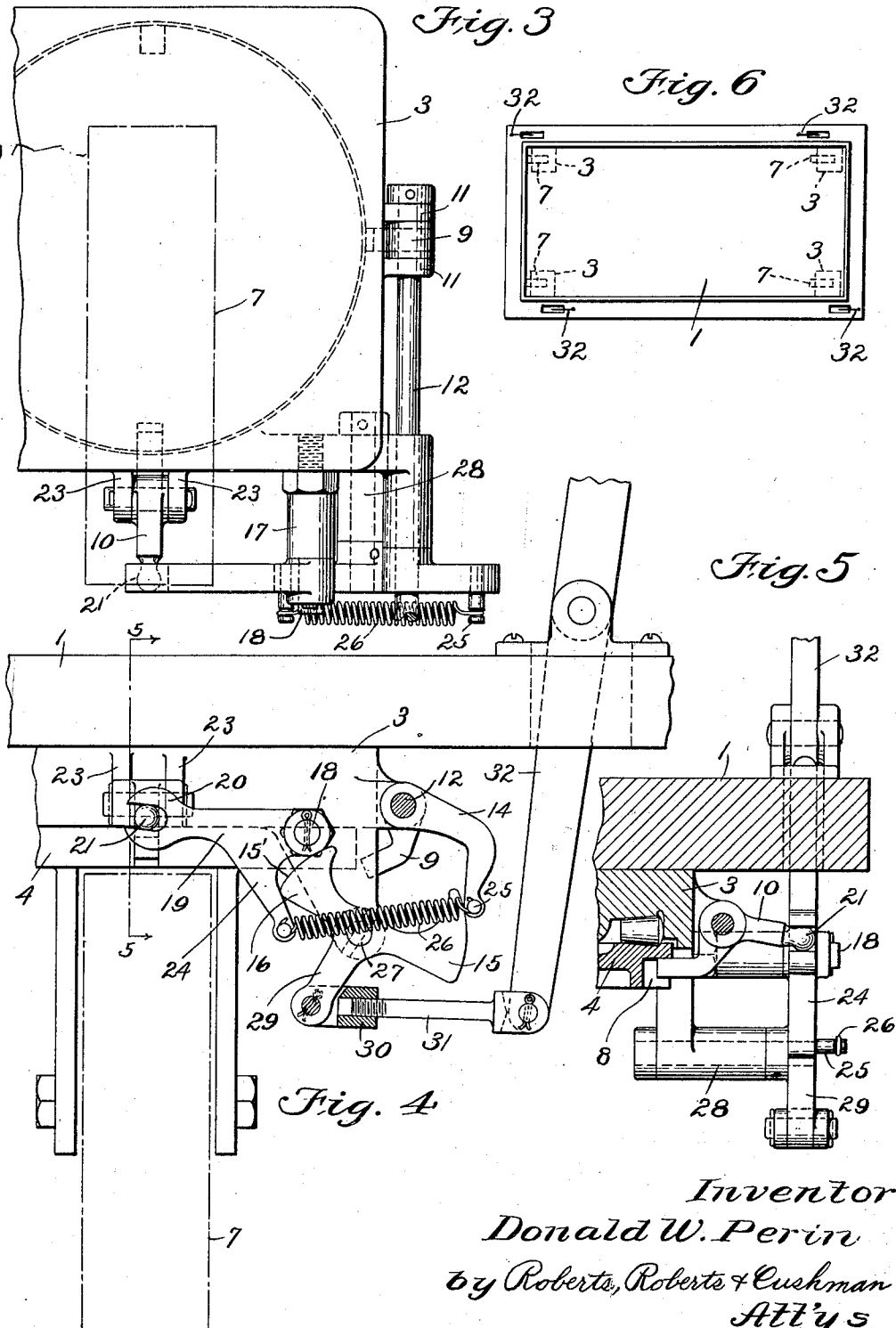
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4 Sheets-Sheet 2



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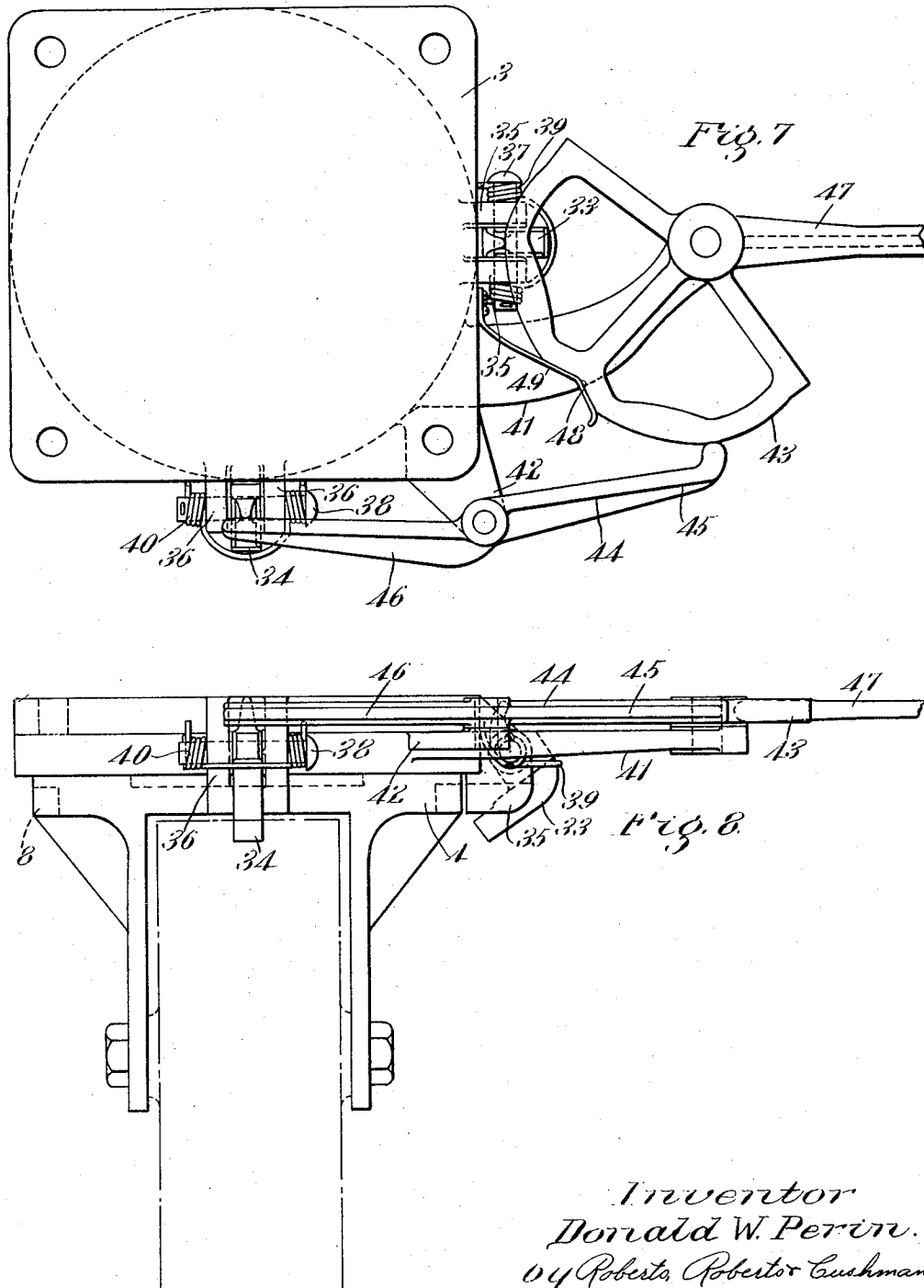
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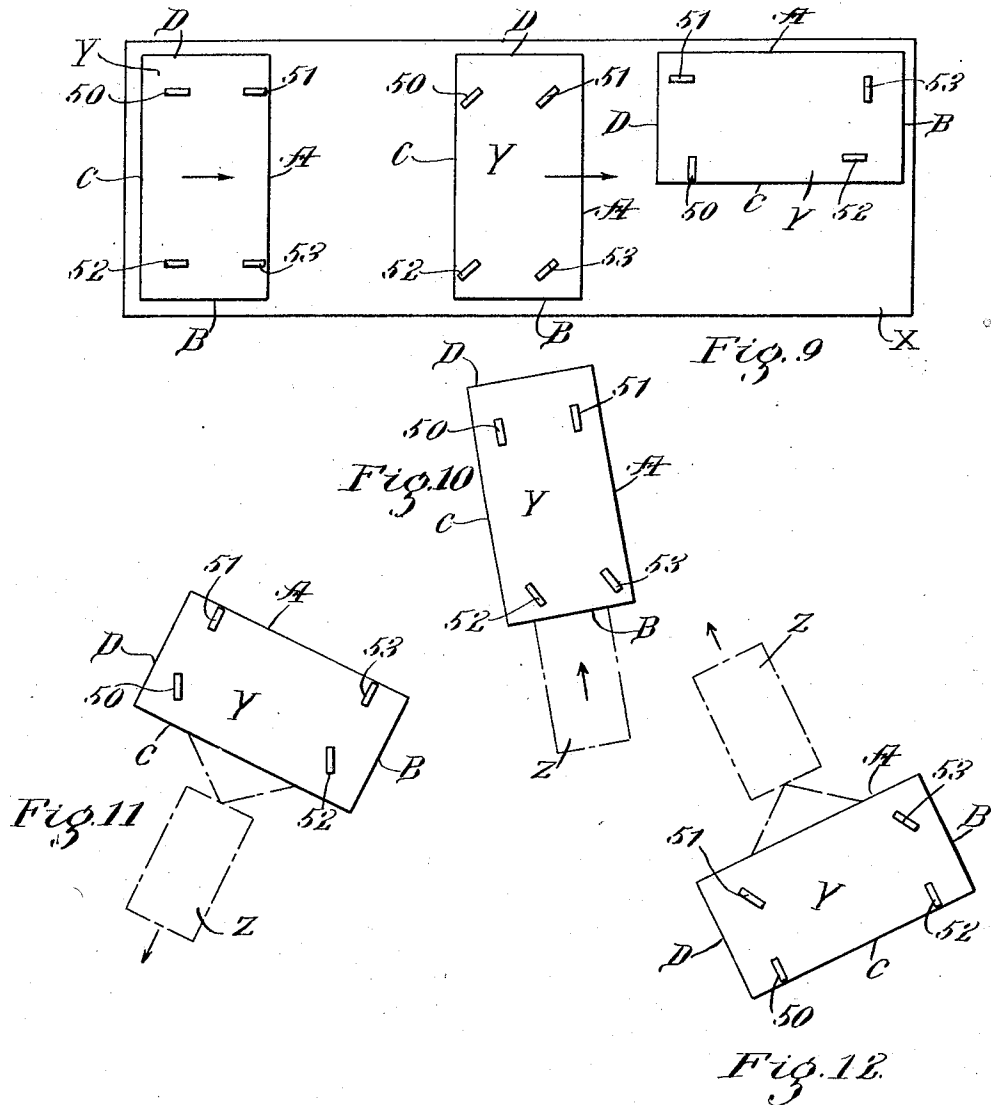
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CONTAINER HAVING SWIVEL CASTERS

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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CONTAINER HAVING SWIVEL CASTERS

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This invention relates to a container movable in and out of vehicles such as automobile trucks, freight cars, ships, etc., provided with several swivel casters adapted to be selectively

locked against swiveling for movement of the container in predetermined directions by pushing or pulling from any one of its sides.

In moving a container into and out of vehicles and around freight depots and docks

restricted and narrow places are often encountered so that it is necessary for the container to be readily movable in a direction perpendicular to any one of its four sides in order to avoid obstructions and be easily

stowed in available space corresponding in dimensions to the dimensions of the container.

In order to secure this result the swivel casters mounted on the container must be easily and readily locked in different positions corresponding to the desired movement of the

container so that the casters are locked against swiveling for movement of the container in any one of four different directions.

When a container is moved into a freight car the narrow passageway leading into the car requires that the container be moved lengthwise until it is fully in the car when a side-

wise movement of the container is necessary to place it in one end of the car and at the same time maintain the original position of the container relative to the car. This selective

movement of the container is permitted by reason of the fact that any pair of the casters may be positively locked against swiveling

movement so that the container is adapted to be used as a trailer for movement in a direction perpendicular to any one of its four sides whereby it can be steered by pushing or pulling from any selected side. Thus a container

is provided with a wide range of angular movement, without changing the position of the container relative to the plane of its movement, permitting it to be readily moved into any space corresponding to the dimensions

of the container without regard to the position of the space relative to the position of the container.

Objects of this invention are to provide a

container having swivel casters adapted to be

automatically locked against swiveling for

different angular movement in predetermined directions from any one of its sides by the mere actuation of the locking mechanism into locking position; to provide a container having swivel casters adapted to be selectively locked against swiveling for movement of the container in any one of four different directions; and to provide a caster simple in its construction and operation having the new and improved features hereinafter described.

One practical embodiment of this invention is illustrated in the accompanying drawings forming a part of this specification, in which:

Fig. 1 is a top plan view of the caster and locking mechanism therefor embodying one form of my invention;

Fig. 2 is a side elevational view of the caster and locking mechanism shown in Fig. 1 with certain parts of the attaching plate and swiveling frame shown in section;

Fig. 3 is a top plan view of the caster with the caster wheel locked in a position at right angles to the position of the caster wheel shown in Fig. 1;

Fig. 4 is a side elevational view of the caster and locking mechanism therefor shown in Fig. 3;

Fig. 5 is a vertical sectional view on line 5-5 of Fig. 4;

Fig. 6 is a plan view of a container with my improved casters applied thereto;

Fig. 7 is a top plan view of the caster similar to the view shown in Fig. 1 but showing a modified form of locking mechanism;

Fig. 8 is a side elevational view of the caster and locking mechanism shown in Fig. 7;

Fig. 9 is a diagrammatic view of a box car with a number of containers therein showing the facility with which the containers may be moved from place to place by the arrangement of the casters according to my invention;

Fig. 10 diagrammatically illustrates a container having the casters at one side locked against swiveling and the casters free to swivel at an opposite side whereby the containers may be steered when pushing or pulling from the side adjacent the freely swiveling casters;

Fig. 11 diagrammatically illustrates a container having casters locked against swiveling at a side at right angles to the side having locked casters in Fig. 10 and shows how the container may be steered by pulley; and

Fig. 12 is a view similar to the view shown in Fig. 11 showing the container steered by pulling.

As illustrated, the numeral 1 designates the bottom of a container having casters 2 attached thereto to facilitate the movement of said container from place to place. Each caster 2 comprises an attaching plate 3 fastened in some suitable manner to the bottom of the container 1 and adapted to receive the frame 4 in swiveling relation thereto, suitable anti-frictional bearings 5 being provided between the attaching plate and frame. Depending fork members 6 project from the plate 4 and have a roller or wheel 7 journaled between their lower ends. A pair of aligned locking recesses 8 diametrically located at opposite sides of the frame 4 are adapted to be alternately engaged by locking lugs 9 and 10 depending on the desired direction of travel of the container. Extending from one side of the attaching plate 3 and medially thereof are a pair of ears 11 forming bearings in which a shaft 12 is journaled, the locking lug 9 being splined to said shaft 12 at a point between the ears 11. The shaft 12 extends alongside the plate 3 projecting beyond one side thereof, being journaled in a housing 13 attached to said plate. The end of the shaft 12 projecting from the housing 13 is keyed to a lever 14 having an angular inner surface co-operating with one cam face 15 of the cam member 16 in a manner hereinafter described. A housing 17 also projects from a side of the square plate 3 receiving a shaft 18 journaled therein, the projecting portion of said shaft having a bell crank lever 19 splined thereto. One projecting arm of the bell crank lever 19 terminates in a forked portion 20 adapted to engage the knob-like portion 21 of the locking lever 10 shown in Figs. 4 and 5. The locking lever 10 has a shaft or pin 22 extending through its intermediate portion, opposite ends of said shaft being journaled in ears 23 projecting from the intermediate portion of a side of the plate 3 at right angles to the side of the plate receiving the ears 11. It will be obvious that actuation of the bell crank lever 19 will correspondingly actuate the locking lever 10 attached thereto. The bell crank lever 19 also has a projecting arm 24 terminating at a point in alignment with the lower end of the lever 14, pins 25 being provided on the arm 24 and lever 14 adjacent their ends to receive the ends of a coiled spring 26 tensioned between said levers 19 and 14. The cam projection 15 of the cam 16 is adapted to ride along the inner angular surface of the lever 14 while the cam projection 15' is adapted to ride along the inner angular sur-

face of the bell crank lever 19, the intermediate portion of said cam having a shaft 27 journaled in a housing 28 attached to the plate 3. An arm 29 projects downwardly from the intermediate portion of the cam 15 to which is attached a link 30 connected to a rod 31 which is connected with the lower end of an operating handle 32, said operating handle extending through the bottom at one side of the container to be conveniently positioned for manipulation. While the above description applies to a single caster element and locking mechanism therefor it will be understood that the container is adapted to have three or more (preferably four) such casters, all of which are separately locked against swiveling so that any desired combination of locked casters may be secured.

The operation of the device is as follows: Assuming that the operating handle 32 has been moved to the position shown in Fig. 2 the rod 31 moves rearwardly with the link 30 causing the cam surface 15 to move upwardly whereby the heel of said cam surface rides into the deepest portion of the angular surface of the lever 14 causing said lever to move inwardly by reason of the tension of the spring 26, whereby the shaft to which the lever is splined is rotated in a clockwise direction moving the lug 9 into locking position. Simultaneous with the above described action of the cam 15 the heel of the cam surface 15' rides downwardly against the surface of the arm 24 of the bell crank lever 19 causing said bell crank lever to pivot about its axis, whereby the forked end 20 moves upwardly lifting the knob 21 and thus the locking lever 10 out of locking position. If neither of the aligned recesses 8 are in a position to be engaged by the locking lug 9 said lug will be yieldingly held against the peripheral surface of the frame 4, by reason of the tension of the spring 26, ready to assume a locking position when either of said recesses come into a position to be engaged thereby.

When the operating handle is moved to the position shown in Fig. 4 the heel of the cam surface 15 rides against the lower end of the lever 14 moving said lever 14 outwardly and the locking lug 9 out of locking position while the heel of the cam surface 15' moves upwardly permitting the bell crank lever 19 to move downwardly whereby the locking lever 10 is moved into locking position. When the operating handle is in a vertical position intermediate the extreme positions shown in Figs. 2 and 4 the cam member 16 will be in a position whereby the cam surfaces 15 and 15' engage the levers 14 and 19 so that both locking lugs 9 and 10 are out of locking position and the caster is in a freely swiveling position. Thus a caster construction is provided whereby said caster is automatically and selectively locked against swiveling for movement in any one of four directions by

the mere actuation of the operating handle 32 so that any manual actuation of the caster in order to change its directional movement is rendered unnecessary.

As illustrated in Figs. 7 and 8 showing a modified form of locking mechanism but constituting the preferred form of my invention, the attaching plate 3 fastened in some suitable manner to the bottom of the container 1 is adapted to receive the frame 4 in swiveling relation thereto, suitable anti-frictional bearings not shown being provided between the attaching plate and frame as shown in Figs. 2 and 5. A pair of aligned locking recesses 8 diametrically located at opposite sides of the frame 4 are adapted to be alternately engaged by locking lugs 33 and 34, controlling the direction of travel of the container. Extending from two adjacent sides of the attaching plate 3 are ears or lugs 35 and 36, respectively, similar to the ears 11 and 23 shown in Fig. 3 and adapted to form bearings for the pins 37 and 38 of the locking lugs 35 and 36 respectively. Each pin 37 and 38 has a double torsion spring 39 and 40 normally actuating the locking lugs into locking position. Brackets 41 and 42 project from the attaching plate 3 to receive the cam 43 and lever 44 respectively pivoted thereto. The lever 44 fulcrumed intermediate its ends on the bracket 42 has projecting arms 45 and 46, the arm 45 being adapted to ride along the surface of the cam member 43 while the arm 46 engages the upper end of the locking lug 34. The cam member 43 is fulcrumed on the bracket 41 and has a handle 47 extending from the point of fulcrum permitting its manual actuation. One surface of the cam member 43 corresponding to the surface engaged by lever 44 rides along the upper end of the locking lug 33. The surface of the cam engaged by the lever and the locking lug 34 in the position shown in Fig. 7 is of maximum curvature, the curvature decreasing from these points toward each end of the cam member. Intermediate the peripheral surface of the cam member 43 there is formed a V-shaped recess 48 adapted to receive a correspondingly shaped end of a spring 49, the other end of said spring being rigidly attached to the plate 3. The purpose of the spring 49 is to urge the cam toward the position shown in Fig. 7.

The operation of the device shown in Figs. 7 to 8 is as follows: As shown in Fig. 7 the cam member 43 at its points of maximum curvature engage the locking lug 33 and lever 44 so that both the locking lugs 33 and 34 are out of locking position and the caster is free to swivel. If by actuation of the operating handle 47 the cam member 43 is moved in a clockwise direction the end 45 of the lever 44 rides along a portion of the cam surface 43 of lesser curvature permitting the end 46 of the lever 44 to move away from the upper end

of the locking lug 34 and thus allow said locking lug to be actuated into locking position through the action of the double torsion spring 40. Inasmuch as the locking lug 33 is still engaging the cam member 43 at a point of maximum curvature said locking lug 33 remains out of locking position while the locking lug 34 is in locking position to cause the caster to be locked in position to move the container in either of two opposite directions. By moving the cam member 43 in a counterclockwise direction from the position shown in Fig. 7, the arm 46 rides along the surface of the cam member of maximum curvature while retaining the locking lug 34 in unlocked position while a surface of the cam member 43 of lesser curvature comes opposite the locking lug 33 permitting said locking lug to be actuated into locking position and thus locking the caster against swiveling for movement of the container in either of two opposite directions and at right angles to the first movement above described.

A typical mode of handling freight constituting part of the present invention is illustrated in Figs. 9 to 12 in which X represents a box car, Y a container such as above described and Z an electric vehicle such as customarily used in freight depots for pulling or pushing trucks. In these figures, the four sides of the containers have been lettered A, B, C and D respectively and the casters numbered 50, 51, 52 and 53, the pair of casters 51 and 53 being adjacent side A, 52 and 53 adjacent side B, 50 and 52 adjacent side C and 50 and 51 adjacent side D. In order to pull the container to the side as a trailer the casters opposite the side on which the container is pulled are locked. Thus in Fig. 11 where the container is being pulled from the side C, the casters 51 and 53 are locked while the casters 50 and 52 are unlocked. In Fig. 12 where the container is being pulled from the side A the casters 50 and 52 are locked while the casters 51 and 53 are unlocked. When pushing the container, as illustrated in Fig. 10 for example, the casters opposite the side from which the container is being pushed are locked. Thus in Fig. 10 the casters 50 and 51 are locked and the casters 52 and 53 are unlocked. After a container has been pushed into a box car in the position shown at the middle of Fig. 9 it is ordinarily pushed sideways to one end of the car, for example in the position shown in the left hand end of the car of Fig. 9. To accomplish this all of the casters are unlocked so that when the movement of the container is changed from longitudinal to transverse movement casters may swivel into parallelism with the ends B and D of the container.

After the ends have swiveled in such position they may be locked to cause the container to follow a straight path to the end of the car arranged in the position shown in Fig.

12 or left unlocked until the container reaches the end of the car or other final position. All of the casters are then locked so that they can not swivel when the container is moved in the reverse direction in the unloading operation. This prevents the casters from swiveling when the container is moved in the reverse direction and thereby prevents the container from jamming against the sides of the car on account of the casters swiveling.

In the unloading operation all of the casters are unlocked when the container reaches the position shown at the center of Fig. 9 and the container is pulled out through the side door of the car. After the container is started the locking levers of the two rear casters 50 and 51 are preferably thrown into position to lock these two casters in position parallel with the sides of the container so that it will steer as a trailer when passing out through the door and during any subsequent movement. Obviously the container may be moved into and out of other restricted places in a similar manner.

In the case of the container at the right hand end of Fig. 9 each caster is locked in a different one of the four possible positions so that the container can not roll in any direction.

It will be understood that the structure above described illustrates practical embodiments of the invention whereby the caster is automatically and selectively locked against swiveling for movement of the container in any one of four different directions. It is not intended to limit the device to the structural details shown and described, but my structure may be altered to embrace any mechanical arrangement constituting an equivalent structure to that above described. For instance, it comes within the purview of my invention to provide the swiveling frame of the caster with two locking recesses arranged at right angles in different planes whereby a single pivoted lever, having locking lugs at each end can be selectively actuated into locking position, or a single locking lug movable into locking position to selectively engage one of said angular locking recesses may be employed.

I claim:

1. In a container having a plurality of swivel casters, independently operable locking means for each caster, said locking means comprising a locking lug, a spring tending at all times to force said lug into locking engagement with said caster, and an actuator having a sliding engagement with said lug and acting in one position to hold said lug against the tension of the spring, out of locking engagement with said caster, the actuator coacting directly with the lug independently of the spring.

2. In a container having a plurality of swivel casters, independently operable lock-

ing means for each caster, said locking means comprising a locking lug, a spring tending at all times to force said lug into locking engagement with said caster, and an actuator mounted independently of said lug but having a sliding engagement therewith and acting in one position to hold said lug, against the tension of the spring, out of locking engagement with said caster, the actuator coacting directly with the lug independently of the spring.

3. In a container having a plurality of swivel casters, independently operable locking means for each caster, said locking means comprising a locking lug having a locking position and an unlocking position, a spring attached to said lug and tending at all times to hold said lug into one of said positions and a pivotally mounted actuator having a sliding engagement with said lug and operable to act to hold said lug in the other of said positions against the urge of said spring, the actuator coacting directly with the lug independently of the spring.

4. In a container having a plurality of swivel casters each including an element having a plurality of notches therein, independently operable means for each caster, said locking means comprising a lug capable of engaging any of the notches in the element and thereby locking the caster against swiveling, a spring normally tending to advance the lug in locking engagement with the element and a movable actuator having a sliding engagement with the lug and independent of the spring, said actuator in one position holding said lug against the urge of the spring out of locking engagement and in another position permitting the spring to advance the lug into engagement with a notch when the caster is swiveled into a predetermined position.

5. In a container having a plurality of swivel casters each including an element having a plurality of notches therein, a pair of movable lugs capable of engaging any of the notches in the element and thereby locking the caster against swiveling, means normally tending to advance said lugs into locking engagement with the element and movable actuating means having engagement with each lug, which means in one position prevents such advance of either of said lugs, and in another permits the advance of one lug while preventing the advance of the other lug.

6. In a container having a plurality of swivel casters each including an element having a plurality of notches therein, a pair of movable lugs capable of engaging any of the notches in the element and thereby locking the caster against swiveling, spring means coacting with each lug and normally tending to advance said lugs into locking engagement with the element and movable actuating means having engagement with each lug,

which means in one position prevents such advance of either lug and in another position permits the advance of one lug while preventing the advance of the other lug.

5 7. In a container having a plurality of swivel casters each including an element having a plurality of notches therein, a pair of pivotally mounted lugs, one end of each lug being capable of engaging any of the notches
10 in the element and thereby locking the caster against swiveling, spring means coacting with each lug for advancing such end thereof into locking engagement with the element and movable actuating means having engage-
15 ment with the other end of each lug which means in one position prevents the advance of the locking end of either lug and in another position permits the advance of the locking end of one lug while preventing the
20 advancing of the locking end of the other lug.

Signed by me at Boston, Massachusetts,
this 28th day of September, 1925.

DONALD W. PERIN.

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